

Amendments to the Claims:

This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Currently Amended)** An apparatus for detecting vulnerable plaque within a lumen defined by an intraluminal wall, the apparatus comprising:

a probe having

an optical fiber extending therethrough, and

an atraumatic light-coupler [~~in-optical-communication~~] in contact with the optical fiber, the coupler being configured to atraumatically contact the intraluminal wall at a point at which light exits the atraumatic light-coupler and enters the wall;

a light source in optical communication with the fiber for illuminating the wall; and

a detector in optical communication with the fiber for detecting light from within the wall.
2. **(Previously presented)** The apparatus of claim 1, wherein the probe further comprises a jacket enclosing the fiber.
3. **(Previously presented)** The apparatus of claim 2, wherein the jacket comprises a coil-wire wound into a coil-wire jacket.
4. **(Previously presented)** The apparatus of claim 3, wherein the jacket comprises a coil wire having a variable diameter.

5. **(Previously presented)** The apparatus of claim 1, wherein the probe comprises a plurality of optical fibers.
6. **(Currently Amended)** The apparatus [e] of claim 1, wherein the probe resiliently assumes a preferred shape.
7. **(Previously presented)** The apparatus of claim 6, wherein the preferred shape comprises a bow.
8. **(Previously presented)** The apparatus of claim 6, wherein the preferred shape comprises an arc.
9. **(Previously presented)** The apparatus of claim 6, wherein the preferred shape comprises a portion of a catenary curve.
10. **(Previously presented)** The apparatus of claim 1, wherein the atraumatic coupler is disposed at a distal tip of the probe.
11. **(Previously presented)** The apparatus of claim 10, wherein the atraumatic coupler comprises a lens attached to the distal tip of the optical fiber.
12. **(Previously presented)** The apparatus of claim 10, wherein the atraumatic coupler is integral with the optical fiber.
13. **(Previously presented)** The apparatus of claim 12, wherein the atraumatic coupler comprises a distal tip of the optical fiber.
20. **(Previously presented)** The apparatus of claim 1, wherein the light source comprises a near infrared light source.
21. **(Previously presented)** The apparatus of claim 1, further comprising a processor in data communication with the detector, the processor being configured to identify a vulnerable plaque on the basis of a signal provided by the detector.

43. (Original) A method of detecting vulnerable plaque within an intraluminal wall, the method comprising:
- placing an atraumatic light coupler in contact with the intraluminal wall;
 - passing light through the intraluminal wall by way of the atraumatic light coupler;
 - receiving light from within the intraluminal wall by way of the atraumatic coupler; and
 - providing the received light to a processor for analysis to identify the presence of a vulnerable plaque.
44. (Original) The method of claim 43, wherein placing an atraumatic light coupler in contact with the intraluminal wall comprises placing a distal end of a probe in contact with the intraluminal wall.
46. (Previously presented) An apparatus for detecting vulnerable plaque within a lumen defined by an intraluminal wall, the apparatus comprising:
- a probe having
 - an optical fiber extending therethrough, and
 - means for atraumatically contacting the intraluminal wall, the contacting means being in contact with the optical fiber and including means for providing optical communication with the intraluminal wall;
 - a light source in optical communication with the fiber for illuminating the wall; and
 - a detector in optical communication with the fiber for detecting light from within the wall.

47. **(Previously presented)** The apparatus of claim 46, wherein the means for atraumatically contacting the intraluminal wall comprises a rounded surface at a distal tip of the probe.
48. **(Previously presented)** The apparatus of claim 47, wherein the rounded surface comprises a surface of a lens attached to the fiber.
49. **(Previously presented)** The apparatus of claim 48, wherein the means for providing optical communication comprises the lens.
50. **(Previously presented)** The apparatus of claim 47, wherein the rounded surface comprises a surface of the fiber.
51. **(Currently Amended)** The apparatus of claim [43] 46, wherein the means for providing optical communication comprises the fiber.
53. **(Previously presented)** The apparatus of claim 52, wherein the means for providing optical communication comprises a reflective surface in optical communication with the side-window and with a face of the fiber.
54. **(Previously presented)** The apparatus of claim 52, wherein the means for providing optical communication comprises an angled face of the fiber.
55. **(Previously presented)** The apparatus of claim 52, wherein the means for providing optical communication comprises a diffraction grating in optical communication with the side-window and with the fiber.